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Draft Environmental Impact Statement

Aspen Metro Sanitation District
Snowmass Water & Sanitation District

201 Wastewater Facilities Plans

United States Environmental Protection Agency
Region VIII, Denver, Colorado

John A. Green
Regional Administrator

August 1976
Date

Prepared By:
Weiner & Associates, Denver, Colorado

SUMMARY

This is a summary of a draft environmental impact statement (EIS) for proposed construction of additional wastewater treatment facilities at Aspen and Snowmass Resort, Colorado. The National Environmental Policy Act (NEPA, 1969), requires preparation of an EIS whenever federal funds or land are considered for projects with potentially significant environmental impacts. The U.S. Environmental Protection Agency (EPA), under the authority of Section 201 of the Federal Water Pollution Control Act Amendments of 1972, is authorized to grant matching funds for construction costs of designated wastewater treatment facilities. As the granting agency in this case, EPA decided in May 1975 that an EIS was necessary for the proposed Aspen/Snowmass projects. This draft EIS is the result of this decision and will be circulated for comment to other federal, state, and local government agencies as well as citizen groups, individuals, and the news media. A final EIS will then be prepared and circulated, following consideration of comments on this draft.

WHY ADDITIONAL FACILITIES?

The Roaring Fork River is the principal drainage of the study area shown in Figure A. Area growth and development have degraded this river and its tributaries through increased sewage plant (point source) and urban runoff (nonpoint course) discharges. The Act, together with state legislation, has resulted in the establishment of water quality standards for streams and discharge sources. Discharge permits issued by the Colorado Water Quality Control Division for Aspen/Snowmass will require new facilities for control of ammonia, suspended solids and residual chlorine. In addition, discharge of organic matter (biological oxygen demand - BOD), fecal coliform (bacteria), pH, grease and oil must remain ir compliance, thus necessitating cost-effective expansion of present facilities. Copies of "A Citizen's Guide to Clean Water" and "Common Environmental Terms" are enclosed to further explain these regulatory procedures. To aid municipalities in complying with the water quality regulations, the Federal Act provides matching funds for facility construction at a rate of 75 percent. The remaining 25 percent must be paid by local entities, plus all annual operation and maintenance costs.

THE EIS ROLE

An impact statement allows the lead federal agency, in this case EPA, to not only objectively include all environmental considerations into the new facilities design, but also an opportunity for citizen participation. This EIS identifies potential environmental, social, and economic impacts of the proposed projects. It presents issues that were determined during the preparation of the EIS and 201 Facilities Plans (design engineer's report). Methods used to resolve issues are also explained as well as a summary of engineering alternatives proposed to

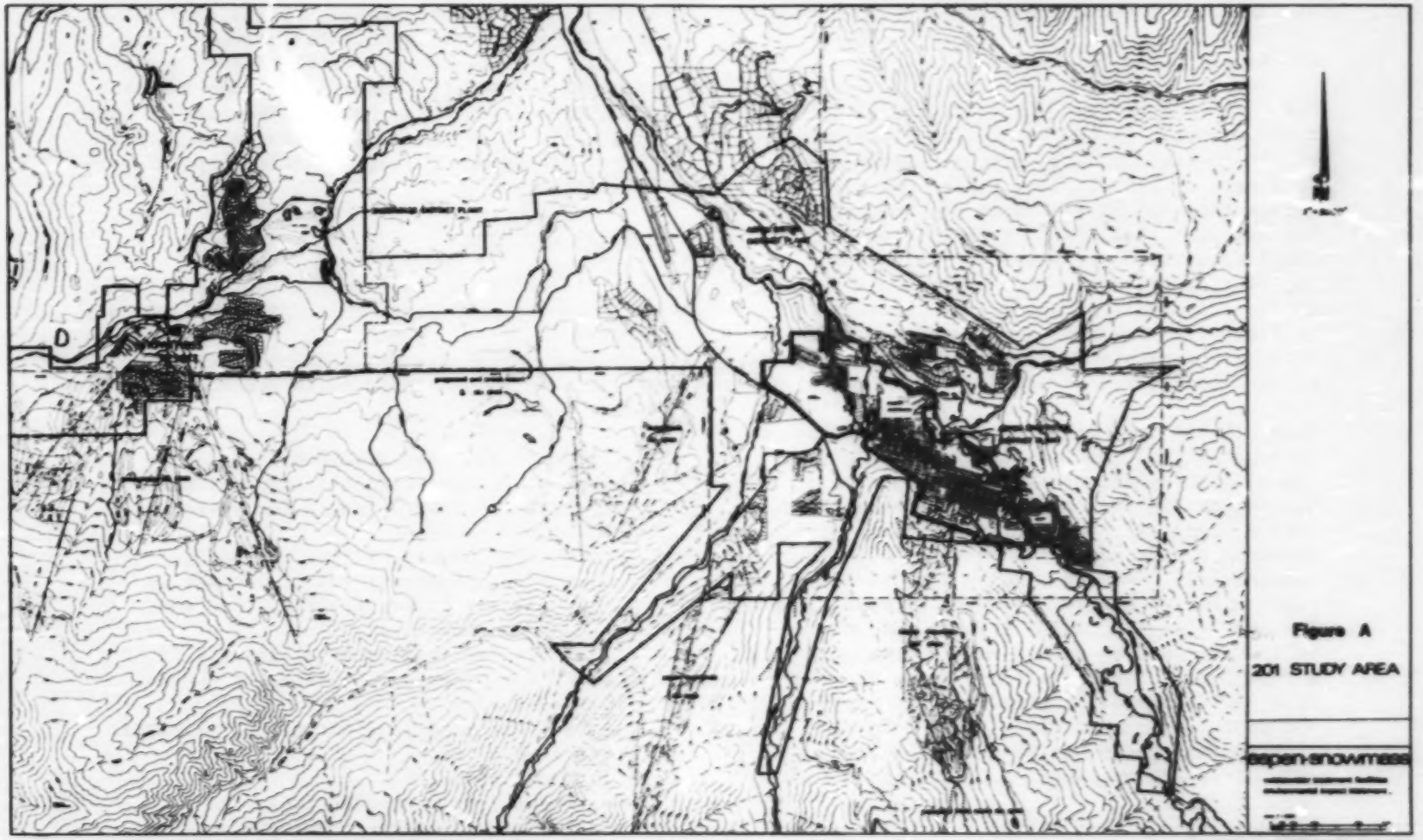


Figure A
201 STUDY AREA
aspen-snowmass

achieve agency requirements. The proposed alternatives and recommended action are then evaluated in terms of environmental impacts.

FACILITIES PLANS

This EIS does not repeat all technical information presented in the Facilities Plans prepared by the design engineer, Wright-McLaughlin Engineers of Denver. The reader may wish to review these plans for Aspen and Snowmass concurrent with this EIS.* A Facilities Plan, as required by the Act, sets out preliminary engineering criteria, alternatives and recommendations; analysis of sewer line inflow and infiltration problems; and presents a cost-effective analysis of the alternatives proposed to meet applicable standards.

This EIS has been prepared for EPA by Weiner & Associates Inc., of Denver. By agreement with the project applicants (Snowmass Water and Sanitation District and the Aspen Metro Sanitation District), the Facilities Plans were prepared at the same time as this EIS. Thus, considerable time and expense were saved in this first phase of the 201 planning process (Step 1). The next element, called Step 2, includes detailed engineering design and is developed once a recommended action is found to be acceptable from environmental, engineering, cost-effective and public points of view. Step 3 is the construction phase of the project and occurs only after EPA approval of Step 1 and 2 tasks.

*Copies available at District and EPA offices.

THE PROBLEM AND THE PLAN

Discussion of environmental, social, and economic issues differentiates between those identified initially but resolved during the planning and EIS processes, and those that remain unresolved at the publication time of this draft EIS. Discussion of issues below is presented according to their relationship to wastewater treatment.

Initial Concerns

This EIS effort began with the development of an "issues paper" which identified environmental factors to be investigated for their relationship to the projects being considered. Those preliminary issues included in the following topics:

- Surface water and groundwater quality;
- Impact of area point and nonpoint discharges and future demand for sewage treatment service;
- Secondary impacts, if any, including growth encouragement and its impact on air quality, noise, traffic, land use, public sentiment, etc.;
- Land use and environmental impacts if new plant sites and interceptor sewers are needed;
- Impact on historical/archeological sites;
- Odor and noise;
- Sludge disposal;
- Economic impact on districts; and
- Floodplains and other geologic factors.

Preservation and enhancement of surface and groundwater quality is the expressed goal of the Federal Act. The intent of Section 201 of the Act is to control point and nonpoint sources and this control remains the principal issue of the EIS.

Nonpoint Sources: A survey of the study area's major waters, entitled, "Water Quality Management Plans for the Roaring Forks River Basin," (Wright-McLaughlin Engineers, 1974), preceded the current 201 planning effort. It concluded that area water quality is significantly affected as runoff from rainfall and snowmelt becomes contaminated while draining ski slopes, rooftops, gutters, pavement and yards. Data based on storm sewer sampling* and computer investigations indicate urban runoff from Aspen currently produces more than twice as much suspended solids and one-third as much organic loading (BOD) on an annual basis as the combined discharges from both sewage plants serving Aspen (Wright-McLaughlin, 1973).

Brush Creek, the principal drainage through Snowmass, picks up suspended solids naturally from exposed Mancos shale outcroppings. However, recent studies estimate that runoff from ski slopes and urban areas contribute about 3.6 times more suspended solids than the only point source on Brush Creek — the Snowmass sewage plant (Wright-McLaughlin, 1975; Lautenbach, et al., 1974).

*Only one of three principal storm sewers in Aspen currently receives treatment via a settling pond.

Point Sources: There are presently three point sources of discharge into study area streams (Figure A). The Aspen Sanitation District (ASD) has an 18-year old trickling filter plant located near the intersection of Mill Street and the Roaring Fork River near downtown Aspen. Its service area includes the central portions of the city proper, while the Aspen Metro Sanitation District (AMSD) serves the balance of the city and the surrounding areas. AMSD owns a modern activated sludge plant three miles (4.8km) downstream from the ASD plant, also on the Roaring Fork River. An outfall sewer connects the ASD and AMSD plants, allowing the ASD plant to treat to its capacity, with excess flows routed to the newer and larger AMSD plant. Treated wastewater (effluent) is discharged to the Roaring Fork River from these plants and it currently meets applicable effluent standards. However, these discharges are not expected to meet the limits to be imposed by July 1, 1977.

Another activated sludge plant is located in the Snowmass portion of the study area discharging its effluent into Brush Creek. This plant is operated by the Snowmass Water and Sanitation District and it meets current discharge limits, with the periodic exception of suspended solids. However, it does not have the facilities necessary to meet future effluent limitations (no effective date specified).

Compliance with water quality discharge standards will require additional facilities at the study area's plants for controlling ammonia, suspended solids (Snowmass only), and residual chlorine. In addition, treatment capacity will have to be enlarged in phases consistent with projected population growth.

Proposed Alternatives: Chapter IV of this draft EIS describes the various proposed treatment options. Based on the population projections supplied, Wright-McLaughlin concluded that the existing Snowmass and Aspen sites could accommodate the study period's (20 years) ultimate populations. Therefore, all point source alternatives utilize present sites and equipment. These alternatives are designed to meet the current and future limits prescribed in the State Discharge Permits. Table S-1 compares present discharges to the 1977 permit requirements and design criteria calculated to meet 1983 goals.

The structural alternatives for point source discharges are summarized in Figure B. Treatment alternatives consist of combinations of secondary, tertiary (advanced) and sludge disposal processes as illustrated.

The proposed alternatives deal with expanded in-plant secondary treatment, sludge disposal, and tertiary measures for ammonia, chlorine residual and suspended solids. These measures included advanced in-plant biological systems for nitrification (ammonia control), mixed-media filters for suspended solids control and new chlorination techniques.

Land application is also considered as a final method of wastewater treatment. This technique uses suitable soil as a natural filter media for solids and allows the ammonia to be converted to nitrate, a nutrient for vegetation. Application rates are controlled to assure aerobic soil conditions and to minimize the possibility of nitrate accumulations in the groundwaters. Study Map 3 displays those areas now under consideration for the land application approach.

Nonpoint sources are an obvious problem in the study area. Although Section 201 of the Act provides for control of these sources, no structural alternatives have been proposed. This is due in part to limitation of federal funds allocated to Colorado 201 projects and to anticipated results of a further study, authorized by the Federal Act's Section 208. EPA feels that control of nonpoint sources in the study area will be necessary to achieve the water quality goals of the Act. Therefore, EPA intends to work with Pitkin County, the City of Aspen, Wright-McLaughlin and the Colorado Water Quality Commission to settle this unresolved issue prior to issuance of the final EIS.

Evaluation of Proposed Alternatives: Area citizens urge the 1977 abandonment of the ASD plant because of periodic odors and its close proximity to nearby residences. Although a slightly more expensive approach, early retirement would eliminate the operation of two plants at different locations, thus benefiting from the economies and efficiencies found in a larger single plant. With an adequate connecting interceptor already in place between the ASD and AMSD plants, retirement and corresponding enlargement at Metro is a preferable action. The ASD plant could then be considered as a structural alternative for urban runoff control in Aspen.

Since the Snowmass and Metro plants are both reliable activated sludge secondary plants the

TABLE S-1

POINT SOURCE DESIGN CRITERIA

	ASD PLANT (Mill Street)-mg/ℓ			ASPEN METRO PLANT-mg/ℓ			SNOWMASS PLANT-mg/ℓ		
	Present Discharge (range-mg/ℓ)	1977[1] Limit	1983[2] Goal	Present Discharge (range-mg/ℓ)	1977 Limit	1983[3] Goal	Present Discharge (range-mg/ℓ)	1977 Limit	1983[3] Goal
BOD	8-16	22(94)[4]	0	6-17	22(370)	13(464)	6-14	30(200)	15(200)
Suspended Solids	11-19	22(94)	0	4-19	22(370)	13(464)	8-38	30(200)	20(267)
Fecal Coliform	2000	200/100ml	0	<2000	200/100ml	200/100ml	<2000	200/100ml	200/100ml
Residual Chlorine	0.2-0.3	0.02	0	0.2-0.5	0.03	0.05	0.5-1.5	0.05	0.05
Ammonia (NH_3- N)	12.4-40.0	2.7(11.4)	0	2.3-30.0	4.9(81.6)	3.0(93)	2.0-8.6	0.6(2.0)	0.3(2.0)
pH	6.9-7.4	6.0-9.0	0	7.1-7.4	6.0-9.0	6.0-9.0	7.3-8.7	6.0-9.0	6.0-9.0
Design Flow	0.45mgd[5]	0.5mgd	0	1.05mgd[5]	2.0mgd	4.1mgd	0.35mgd[5]	0.8mgd	1.6mgd

1 Effective July 1, 1977, 30 day average
2 Assumes plant retirement in 1977
3 Variable limit - most stringent month shown (August)
4 ( ) units of lbs/day
5 Average Yearly Flow

FIGURE B

Aspen Treatment Alternatives

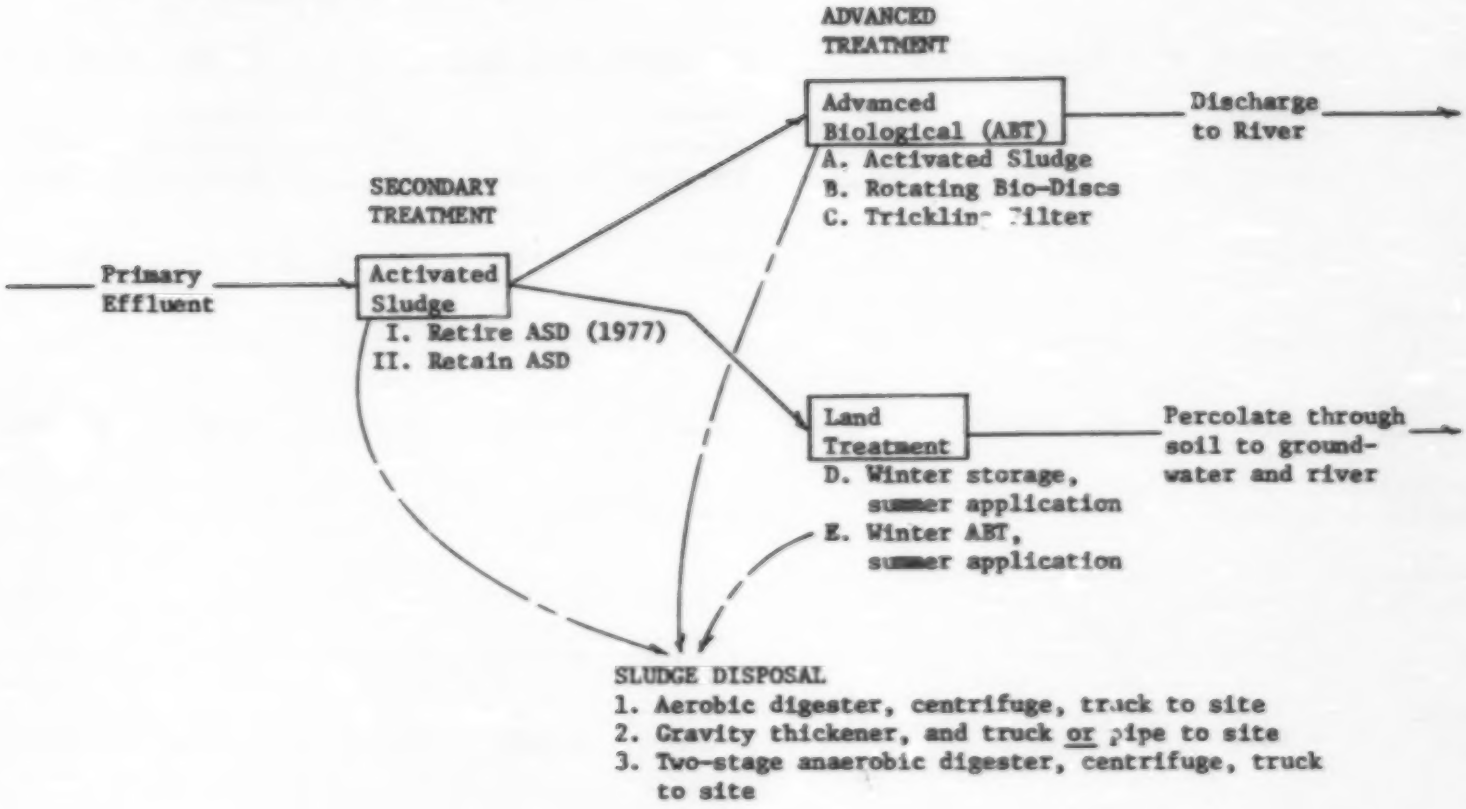
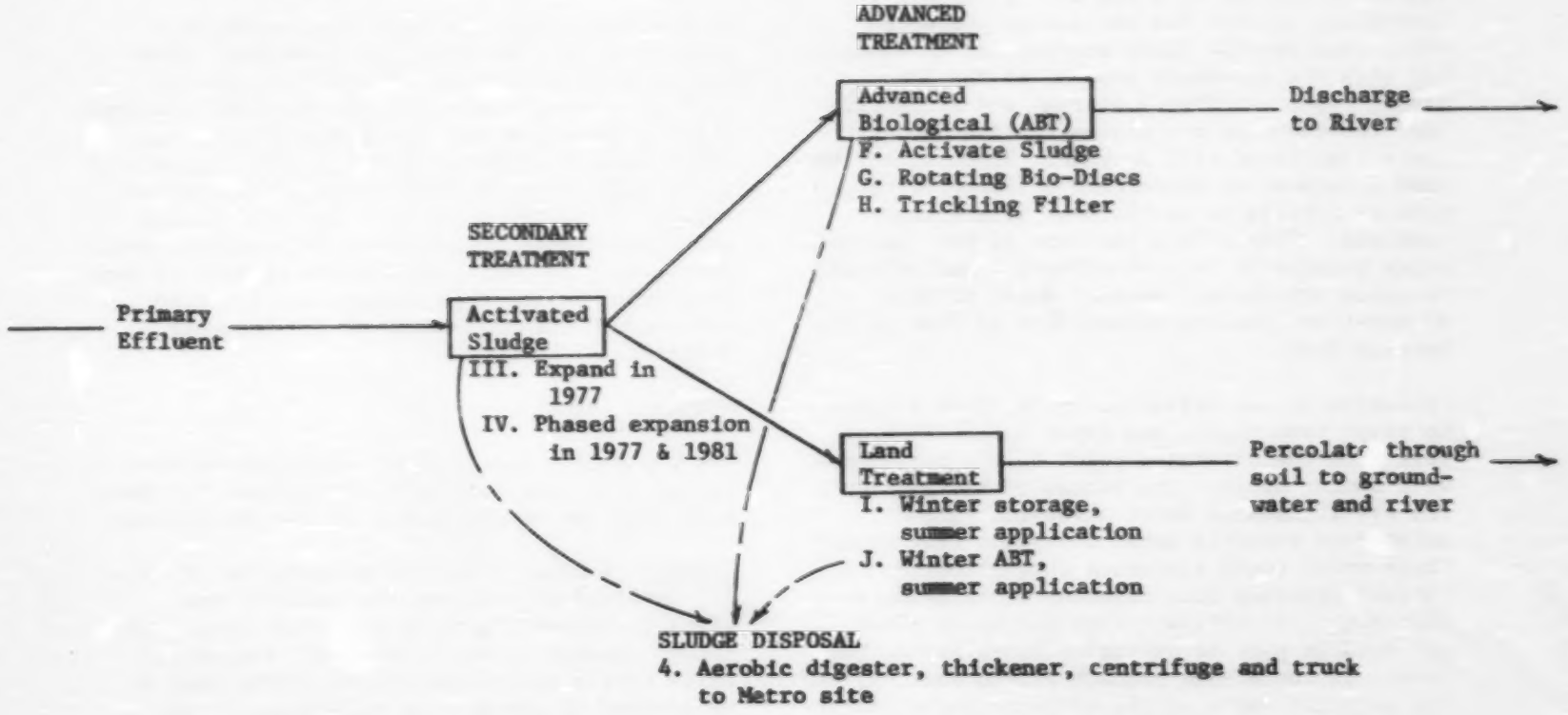


FIGURE B (continued)

Snowmass Treatment Alternatives



proposed expansions seem justified. The major treatment decisions to be made concentrate on the tertiary or advanced levels. In Aspen, ammonia control must be maintained during peak tourist seasons — summer and winter. The cost-effective approach appears to be alternatives with in-plant advanced biological treatment (ABT-Alternatives A, B and C). Alternative C (trickling filter) has the lowest projected cost, requires the least energy, and is compatible with the secondary process at the AMSD plant. Winter effluent storage and summertime land treatment is not cost-effective due to costs associated with storage. However, ABT with land treatment of summertime effluent (Alternative D) appears to be the best alternative proposed. This offers the best of both technologies because it is cost-effective and utilizes valuable nutrients. Another asset of this alternative involves maintenance of flow in the Roaring Fork.

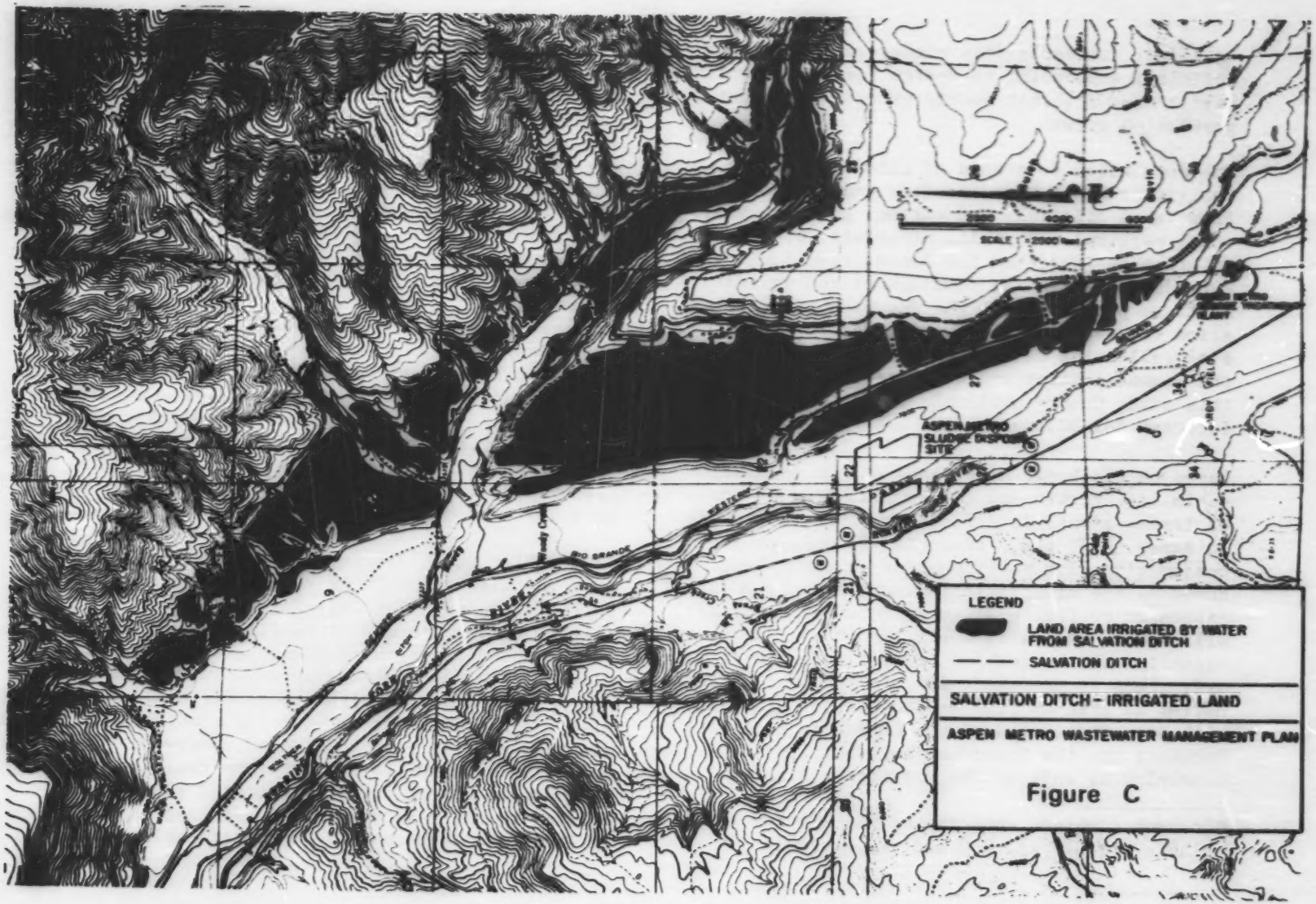
Diversion to the Salvation ditch, from a point up river from Aspen, has dried up the Roaring Fork from the diversion point to the confluence with Hunter Creek. The Bureau of Reclamation's Fry-Ark Transbasin Water Diversion Project authorizes possible water diversion from Hunter Creek which could aggravate this situation by further limiting flow dilution of Aspen Metro discharge. If effluent from the Aspen plant was used as part of Salvation Ditch irrigation water, it would help protect stream quality, use the nutrient value of the effluent and eliminate the need for total ditch diversions and thus maintain minimum flows in the river (Figure C). However, members of the ditch company are reluctant to participate, principally because such participation would bind their land to continued agricultural use in a valley where land speculation has made and lost fortunes for investors. Therefore, ABT and land treatment versus ABT alone remains an unresolved issue with regard to the Aspen Metro plan.

In Snowmass, land treatment appears to be a necessity for cost-effective compliance with discharge requirements. Control of ammonia will be necessary almost year-round and required removal rates are near the limit of existing ABT technology. Here, land treatment appears to provide the most cost-effective nitrification capability (Alternative J). The golf course which belongs to the Snowmass Corporation, would undoubtedly be available for the purpose of land treatment because this company has a vested interest in the well-being of the Snowmass District.

Resolved Issues

The discussion that follows addresses related issues that were initially identified, but have been resolved during Step 1 of the 201 process.

Growth: A major effort in preparation of this EIS involved determining the existing and probable future growth in the study area. Although opinion varies, almost all residents agree that a controlled growth policy must be maintained to protect the well-being of the community. Wastewater treatment facilities, like all other urban services, should be designed to accommodate natural, or desired, growth. It is


LEGEND
LAND AREA IRRIGATED BY WATER FROM SALVATION DITCH
SALVATION DITCH
SALVATION DITCH - IRRIGATED LAND
ASPEN METRO WASTEWATER MANAGEMENT PLAN
Figure C

no longer desirable from either an economic or political standpoint to design facilities which have a capacity that vastly exceeds anticipated population growth.

The population forecasts of this EIS and the Facilities Plans have received general concurrence from local officials and citizen groups. While some, particularly public officials, prefer slower growth than projected for Aspen, they admit that outside pressures for development add validity to these projections. The Snowmass projections allow for reasonable growth needed for the financial well-being of both the resort community and the Snowmass Water and Sanitation District. In this case, County officials agree with the figures forecast for Snowmass.

Based on the broad acceptance of the population estimates, growth and development are not considered issues adversely affected by these 201 projects. In Aspen, 1977 plant expansion is only proposed in conjunction with retirement of the ASD plant. Based on the EIS population projections, major expansion to four million gallons per day (mgd), will not be necessary until 1990.* In Snowmass, capacity will be doubled in 1977 from 0.8 to 1.6 mgd. This is necessary for two reasons: accommodation of planned area growth and compatibility with present plant design. Growth is necessary in Snowmass for the financial well-being of the resort community as well as the District. Although capacity will be doubled, this is not expected to create adverse rapid growth impacts in the area because of county land use controls and the market pressure of high land prices.

The existing Snowmass plant is designed for modular expansions in increments of 0.4 mgd. Even with sewer line inflow and filtration repair, expansion of 0.4 mgd would be necessary in 1977 and 1981. Due to the short period of time between these expansions, Wright-McLaughlin concluded that 1977 expansion to 1.6 mgd is the only cost-effective approach.

These facilities will prevent adverse water quality impacts that would otherwise result from inevitable area growth. However, this same inevitable growth will undoubtedly degrade many conditions in the natural and man-made environments. Appropriate measures, where possible and practical, must be used by the community to minimize these effects.

Sludge Disposal: Sludge disposal methods have improved significantly in recent months due to better handling. The existing disposal site (Figure C) is proposed to remain in use to serve the expanded Aspen and Snowmass plants. In-plant digestion, sludge thickening and trucking is proposed in conjunction with trench disposal at this site. A pipeline system from the plants to the disposal site is also considered, however, spreading and application problems could result from this approach. If properly digested sludge is applied to the trenches, the former approach is environmentally acceptable and preferable because

*Present combined capacity of the ASD and AMSD plants are 0.5 and 2.0 mgd respectively.

the site is well above flood plains and water tables. However, this site has been a source of periodic odor complaints, reportedly resolved by handling improvements. Nonetheless, sludge disposal will remain an important consideration, particularly for residents living close to the site.

Economic Impact on Districts: The local share of capital costs and all annual costs are no longer seen as insurmountable issues confronting the Aspen and Aspen Metropolitan Sanitation Districts. These districts are in sound financial condition and can tolerate even a minimal growth rate (see Chapter IV). The Snowmass Water and Sanitation District is in a much more delicate financial condition. Growth as projected (i.e., approximately 100 units per year) appears to provide long-term stability; however, high service fees will probably continue over the next ten years to service existing debts and new bonds associated with the local share of this 201 project. Total costs have been compared to projected district revenues in Chapter IV of this EIS.

Land Use and Plant Sites: Plant expansion can be accomplished at existing sites, thus eliminating concerns often associated with new plant sites and new interceptor sewers. The ASD plant is the only present site inconsistent with land use goals and citizen preference. As previously mentioned, existence of a connecting outfall sewer facilitates abandonment of the ASD plant for sewage treatment and provides opportunity for nonpoint source control at this location.

Floodplains: All three existing plants are in or adjoin floodplains. The Aspen plants are bordered by the "maximum project flood" as determined by the U.S. Army Corps of Engineers (1974). The Snowmass plant is within a floodplain determined by the U.S. Geological Survey (1972). Flood frequencies have not been determined by the Corps or USGS, however, it is apparent from available data that flood hazard is minimal, with estimated reoccurrence once every 150 years. In addition, flood hazard does not appear to be a significant issue due to the floodplain design of the existing plants. Additional facilities will also be appropriately designed for this potential hazard even though minimal.

Recommended Action

Consideration of all engineering options, agency water quality goals, cost estimates, citizen preference, and environmental factors leads to the recommendation of the following alternatives for domestic sewage treatment:

Aspen - Alternative I/E/1: (1) Expansion of the existing Aspen Metro secondary plant in 1977 from 2.0 to 3.0 million gallons per day (mgd) with the same year abandonment of the ASD plant; (2) Build an advanced biological treatment system (trickling filter or bio-disc) for nitrification with summertime land treatment via the Salvation Ditch; and (3) sludge disposal by aerobic digestion, centrifuge, and trucking to existing Metro disposal site.

Snowmass - Alternative III/J/4: (1) Expansion of the existing Snowmass secondary plant in 1977 from

0.8 to 1.6 mgd; (2) Build an advanced biological treatment system (trickling filter or bio-disc) for nitrification with summertime land treatment via the Snowmass golf course; and (3) sludge disposal by aerobic digestion, centrifuge and trucking to existing Aspen Metro disposal site.

Nonpoint Sources: Control of runoff from urban and nonurban areas of Aspen and Snowmass will be necessary to meet the objectives of the Act. Recognizing that the sanitation districts are not authorized to control such sources, EPA will require that the design engineer, City, County, and State personnel and district representatives meet to negotiate possible structural and non-structural (policy) options which will achieve compliance with the intent of the Act.

Unresolved Issues

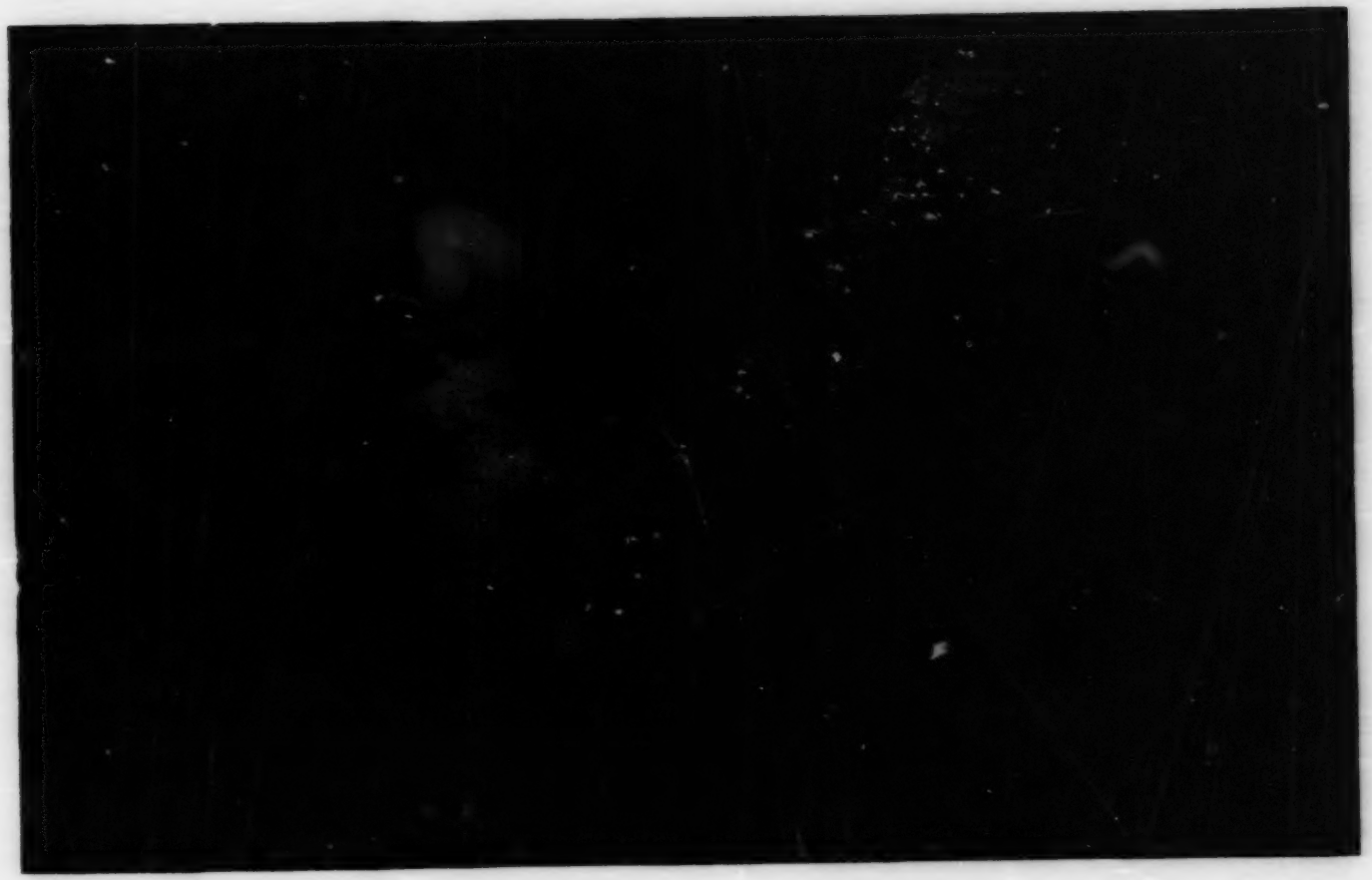
In the preceeding sections, issues have been discussed which were intiially identified in this 201 process. The major issue which remains unresolved at the time of this draft EIS is the control of nonpoint sources.

Agreement with the Salvation Ditch members and a management plan will be necessary for summertime land treatment. Related to use of this ditch for land treatment is maintenance of minimum flow in the Roaring Fork River. Efforts will be made to resolve this issue prior to issuance of the final EIS.

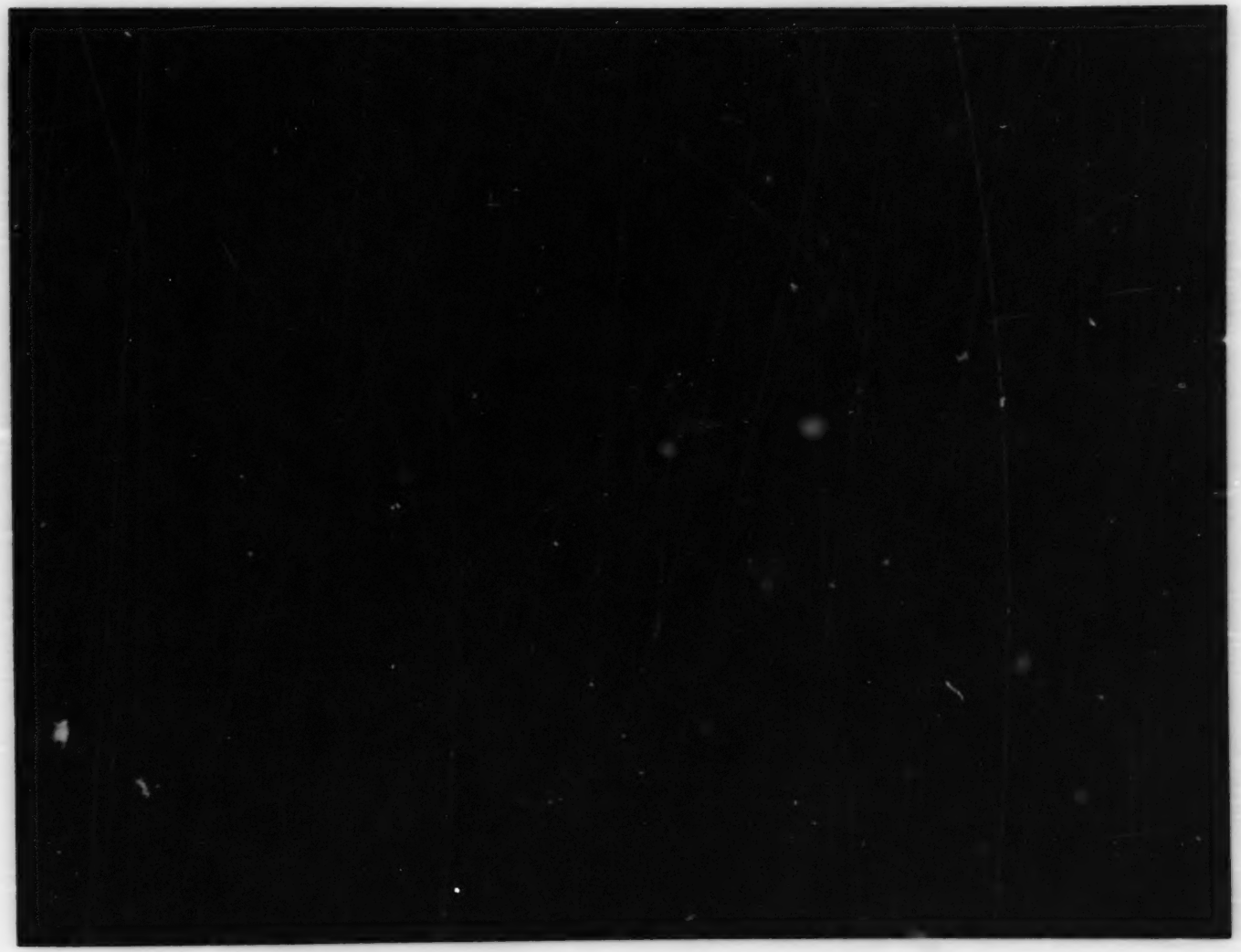
The means of controlling residual chlorine has not been agreed upon by the design engineer and EPA. The design engineer proposes rock channels to do the job, while EPA personnel prefer the use of sulfur dioxide, sodium thiosulfate or sodium bisulfite. Therefore, the control method for this contaminant in sewage plant effluent remains a technical issue to also be resolved prior to the final EIS for these 201 projects.

City of Aspen

Mill Street (ASD) Plant



Aspen Metro Plant

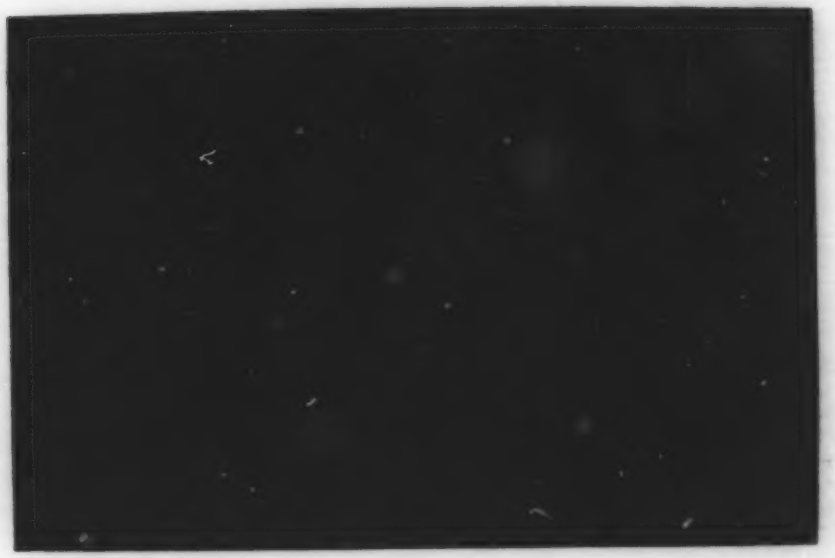


Snowmass District Plant

Snowmass Resort Village

Upper Roaring Fork Valley

Snowmass Plant Outfall to Brush Creek



Present Sludge Disposal Site

Aspen Runoff Settling Pond

Runoff Damage at Snowmass